THE INVENTION CLAIMED IS

1. A method for compensating for flare-induced critical dimension changes in photolithography, comprising:

calculating the flare variation over the area of a patterned mask that will be imaged, and

using mask biasing to largely eliminate the critical dimension changes caused by flare and its variations.

2. The method of Claim 1, wherein calculating the flare variation is carried out by determining the contribution that scattering makes to the point spread function of the camera; calculating the aerial image of the mask pattern that is to be imaged which yields the variation of the flare over the projected aerial image; and based on the aerial image calculated, determining the printed critical dimensions of all the critical features of the mask; then biasing the mask so that the desired critical dimensions are printed.

3. The method of Claim 1, wherein mask biasing is carried out in a mask fabrication process.

4. The method of Claim 2, wherein determining the contribution that scattering makes to the point spread function of the camera is carried out by

measuring the power spectral densities of the roughness of the mirrors that comprise the camera.

5. The method of Claim 2, wherein determining the contribution that scattering makes to the point spread function of the camera, including the effects of diffraction and scattering, is carried out by using extreme ultraviolet interferometry.

6. The method of Claim 2, wherein determining the contribution that scattering makes to the point spread function of the camera, additionally includes checking the intrinsic flare level experimentally including measuring the flare level at many points within the exposure field, comparing the measurements with the calculations.

7. The method of Claim 2, wherein calculating the aerial image of the mask pattern that is to be imaged is carried out by convolving the point spread function due to scattering with the aerial image produced by the camera in the absence of scattering.

8. The method of Claim 2, wherein the method is carried out using a bright field mask or a dark field mask.

9. The method of Claim 2, wherein calculating the aerial image of the mask pattern that is to be imaged is carried out by obtaining an approximation to the aerial image by convolving the point spread function of the camera due to scattering with the ideal aerial image of the mask, which neglects the effects of aberrations and diffraction.

10. The method of Claim 1, wherein calculating the flare variation is carried out by convolving the point spread function of the camera due to scatter with the ideal aerial image of the mask.

11. The method of Claim 2, wherein determining the printed critical dimensions of all the critical features of the mask is carried out using a simple resist threshold model or by using a detailed resist model that incorporates various processing steps including post-exposure bakes and development.

12. The method of Claim 1, wherein calculating the flare variation over the projected mask pattern is carried out using tables constructed from experimentally measured critical dimensions for a print of an unbiased mask.

13. The method of Claim 1, additionally including using an extreme ultraviolet camera.

14. A method for eliminating unwanted critical dimension changes in extreme ultraviolet lithography, which includes:

calculating the flare variation over an area of a patterned mask, and mask biasing to eliminate the critical dimension changes.

15. In an extreme ultraviolet camera, the improvement comprising: compensating for flare-induced critical dimension changes.

16. The improvement of Claim 15, which is carried out by calculating the flare variation over an area of a patterned mask to be imaged by the camera, and using mask biasing to eliminate critical dimension variations caused by flare variations.

17. The method of Claim 1, additionally including minimizing the flare in the aerial image before calculating the flare variation by utilizing either a bright field mask or a dark field mask.

18. The method of Claim 17, wherein a bright field mask is used with a positive photoresist.

19. The method of Claim 17, wherein a dark field mask is used with a negative photoresist.

20. The method of Claim 1, wherein calculating the flare variations is carried out using a phase-shift mask.

21. The method of Claim 14, wherein calculating the flare variation is carried out by determining the contribution that scattering makes to the point spread function of the camera; calculating the aerial image of the mask pattern that is to be imaged which yields the variation of the flare over the projected aerial image; and based on the aerial image calculated, determining the printed critical dimensions of all the critical features of the mask; then biasing the mask so that the desired critical dimensions are printed.

22. The method of Claim 14, wherein mask biasing is carried out in a mask fabrication process.

23. The method of Claim 21, wherein determining the contribution that scattering makes to the point spread function of the camera is carried out by measuring the power spectral densities of the roughness of the mirrors that comprise the camera.

24. The method of Claim 21, wherein determining the contribution that scattering makes to the point spread function of the camera, including the effects of diffraction and scattering, is carried out by using extreme ultraviolet interferometry.

25. The method of Claim 21, wherein determining the contribution that scattering makes to the point spread function of the camera, additionally includes checking the intrinsic flare level experimentally including measuring the flare level at many points within the exposure field, comparing the measurements with the calculations.

26. The method of Claim 21, wherein calculating the aerial image of the mask pattern that is to be imaged is carried out by convolving the point

spread function due to scattering with the aerial image produced by the camera in the absence of scattering.

27. The method of Claim 21, wherein the method is carried out using a bright field mask or a dark field mask.

28. The method of Claim 21, wherein calculating the aerial image of the mask pattern that is to be imaged is carried out by obtaining an approximation to the aerial image by convolving the point spread function of the camera due to scattering with the ideal aerial image of the mask, which neglects the effects of aberrations and diffraction.

29. The method of Claim 14, wherein calculating the flare variation is carried out by convolving the point spread function of the camera due to scatter with the ideal aerial image of the mask.

30. The method of Claim 21, wherein determining the printed critical dimensions of all the critical features of the mask is carried out using a simple resist threshold model or by using a detailed resist model that incorporates various processing steps including post-exposure bakes and development.

31. The method of Claim 14, wherein calculating the flare variation over the projected mask pattern is carried out using tables constructed from experimentally measured critical dimensions for a print of an unbiased mask.

32. The method of Claim 14, additionally including using an extreme ultraviolet camera.